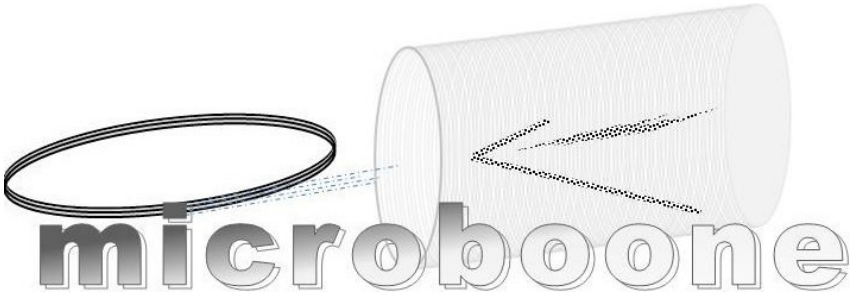


MicroBooNE TPC Assembly and Construction Update

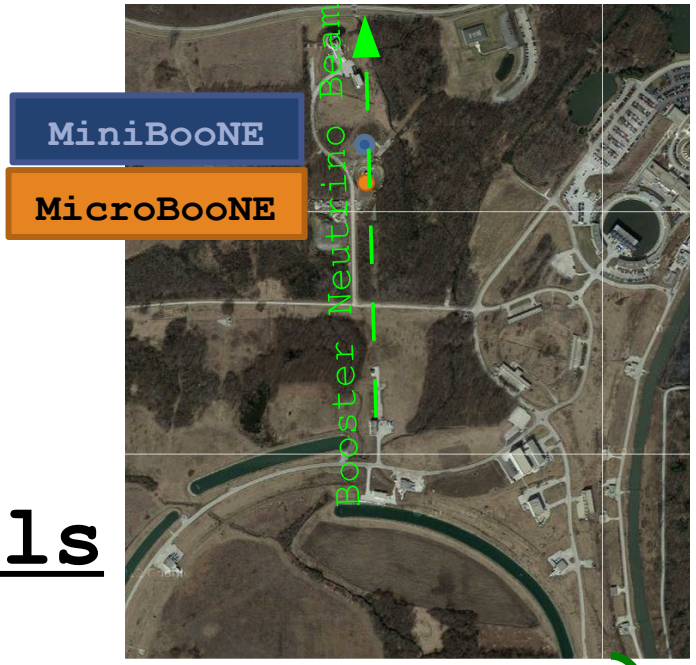
All Experimenters Meeting

September 10th, 2012

Jonathan Asaadi
Syracuse University
On behalf of the MicroBooNE Collaboration

MicroBooNE (E-974)

- **Liquid Argon Time Projection Chamber (LAr TPC)**
  - 170 tons LAr (~84t active)
  - Will be located on the Booster Neutrino Beamline
- **Major advance in neutrino detector technology**



Technology and Physics Goals

- **Test LAr TPC technology at a scope and scale that will inform the next generation of larger LAr TPC detectors**
- **Development of automated reconstruction of neutrino interactions in LAr TPCs**

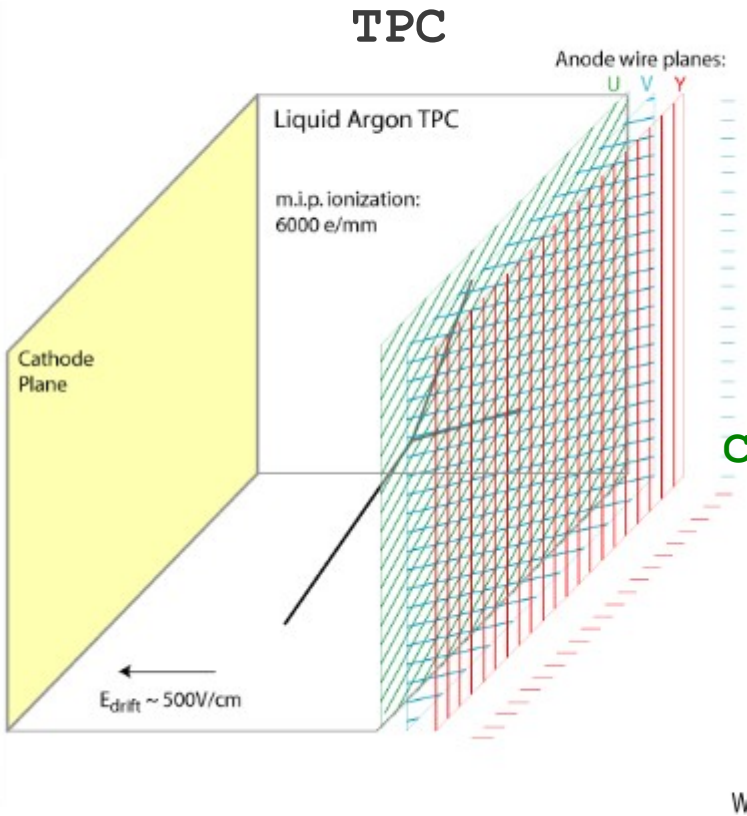
Technology

- **Investigate the low energy excess seen by MiniBooNE by using the unique electron/photon discrimination offered by LAr TPCs**
- **Make the first high-statistics measurements of neutrino interactions in argon**

Physics

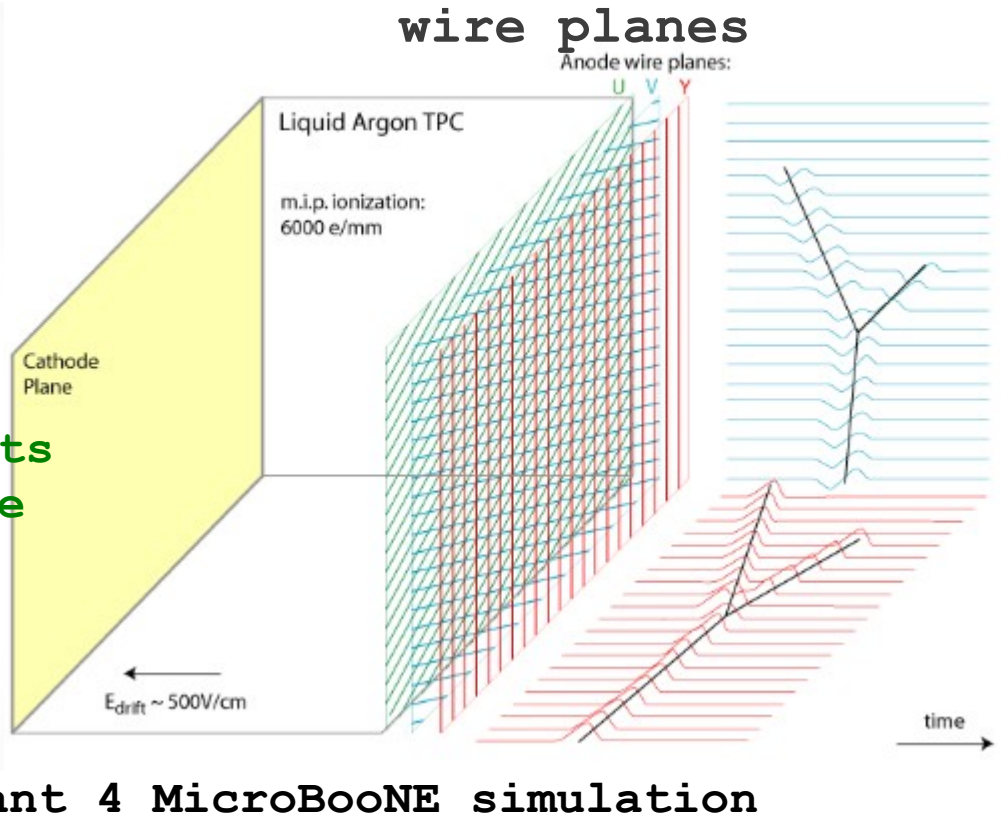
MicroBooNE TPC Operation

Interaction in the TPC

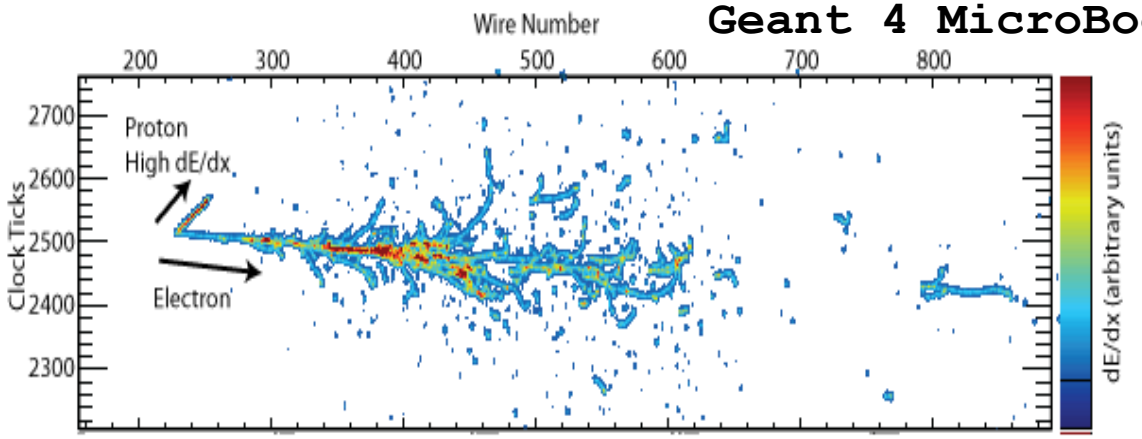


Charge drifts to the wire planes

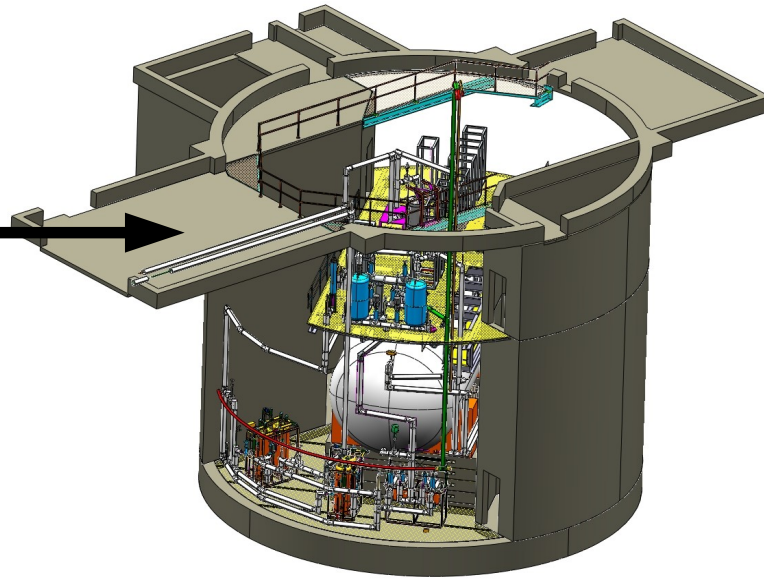
Interaction as seen on the wire planes



Geant 4 MicroBooNE simulation



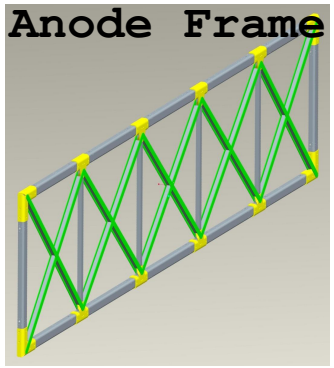
Collection plane



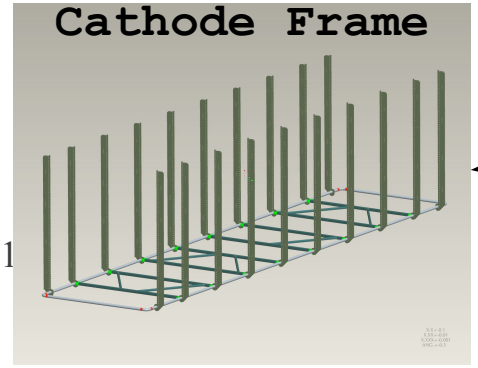
MicroBooNE
inside LArTF

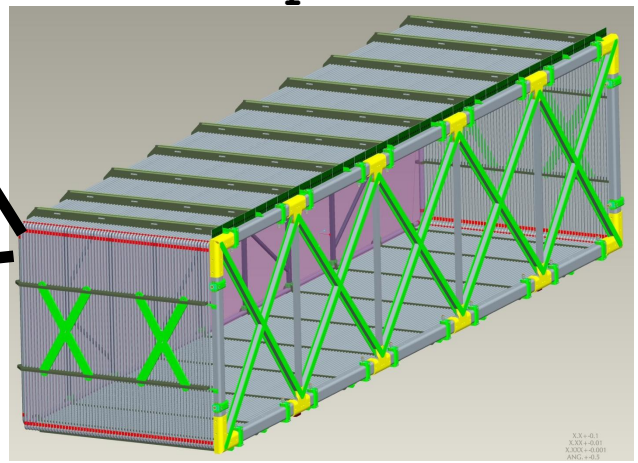
TPC Assembly
(In Reverse)

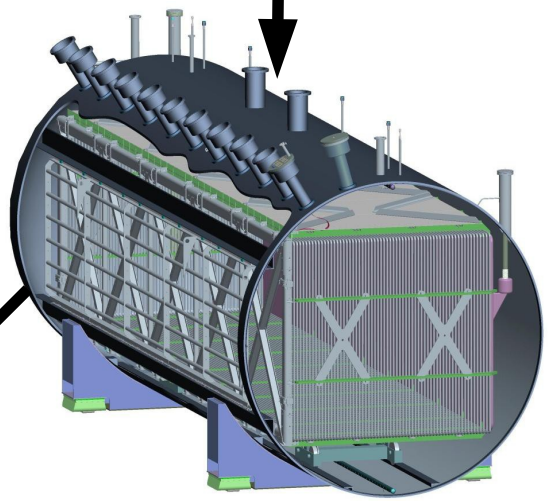
Anode Frame
at DAB



MicroBooNE TPC
Field cage tubes +
wire planes







MicroBooNE
Cryostat + TPC

take 5 for Goal Zero
Avoid injury & reduce environmental impacts.

microboone

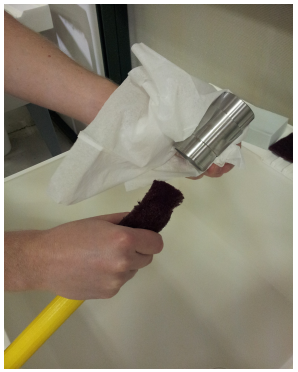
Started the cleaning and transporting of 100's of parts(large and small)in June and the TPC assembly on August 28th with many participating technicians/ scientists/ post-docs/ graduate students and undergraduates

Lots of activities and zero injuries

We are committed to safety

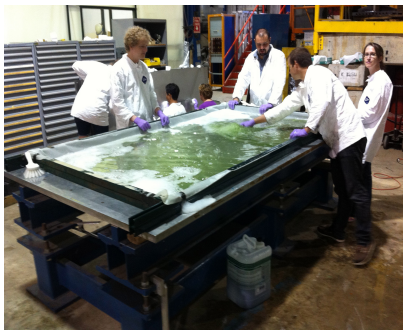
TPC Parts cleaning at Lab F

Lab F TPC parts prep area



Small ultrasonic bath for cleaning hardware & small parts *(Thanks Pete Simon)*

Large TPC parts being cleaned



Cleaned TPC parts wrapped and ready for transport

Transporting parts from Lab F to DØ Assembly Building

Loading TPC parts onto the truck

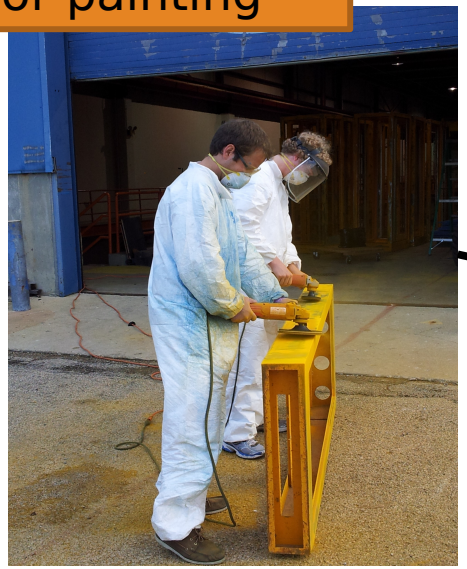
Detector Assembly Area at DØ

TPC parts awaiting assembly at DØ

Thanks to George Ginther And the DØ collaboration

Cabinets and Electronic Racks being prepared at Wide Band Lab

Sanding racks for painting



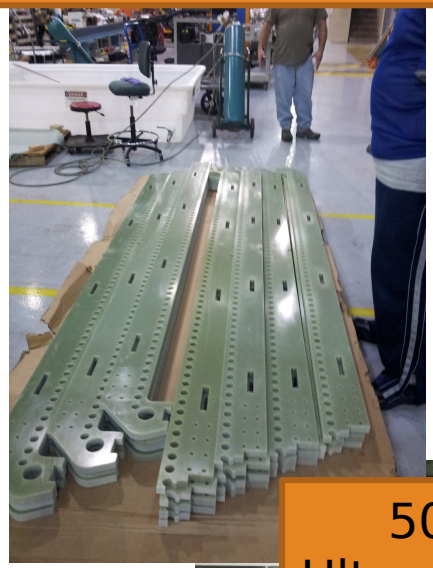
Completed racks stored at DØ

Sanding and painting cabinet doors

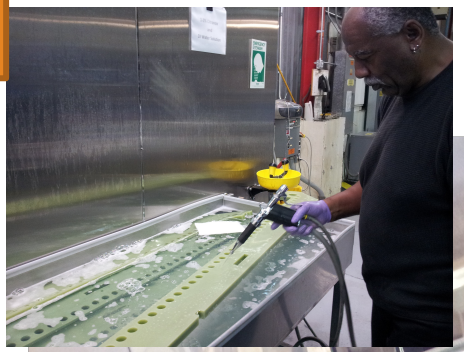
Recycled and re-purposed 18 racks that are ready for equipment

Ultrasonic Cleaning of Large G-10 parts at NWA

Large G-10 parts need ultrasonic cleaning in a large bath



Thanks to the Accelerator Division

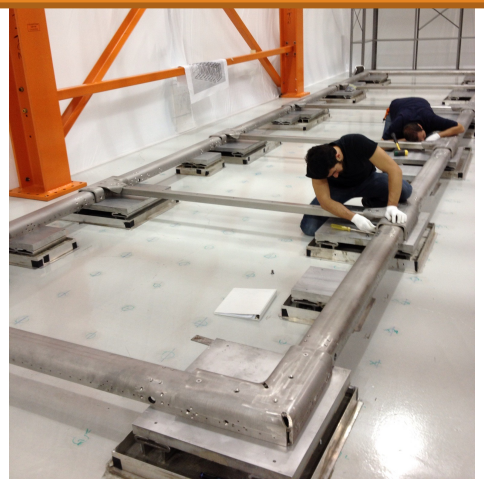


G-10 beams and X-braces were taken to Technical Division for baking and are now ready for assembly

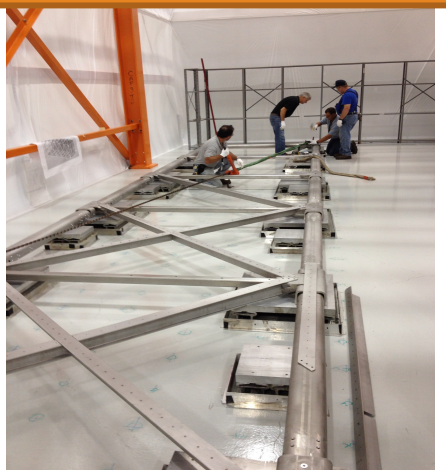
500 Gallon Ultrasonic at NWA

Assembly Activity at DØ
Assembly Building

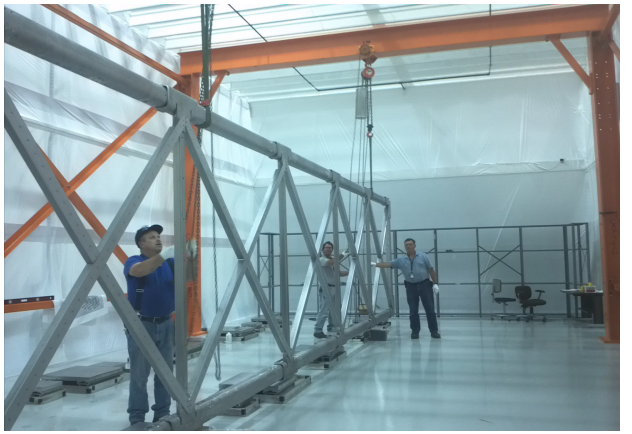
Beginning the assembly of the anode frame



Using a come-along tool and a little elbow grease to square the frame



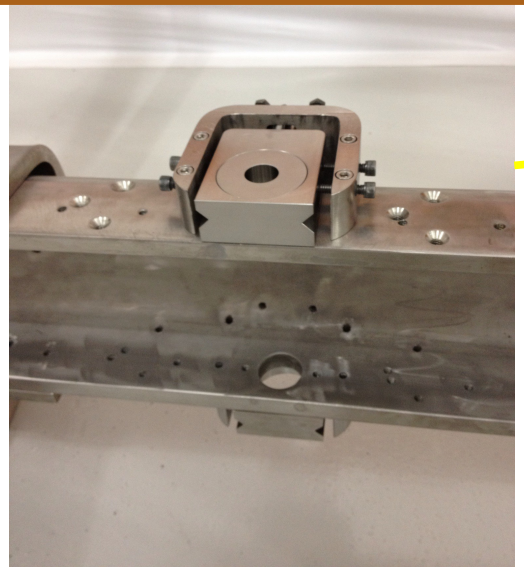
Rotating the anode frame into position



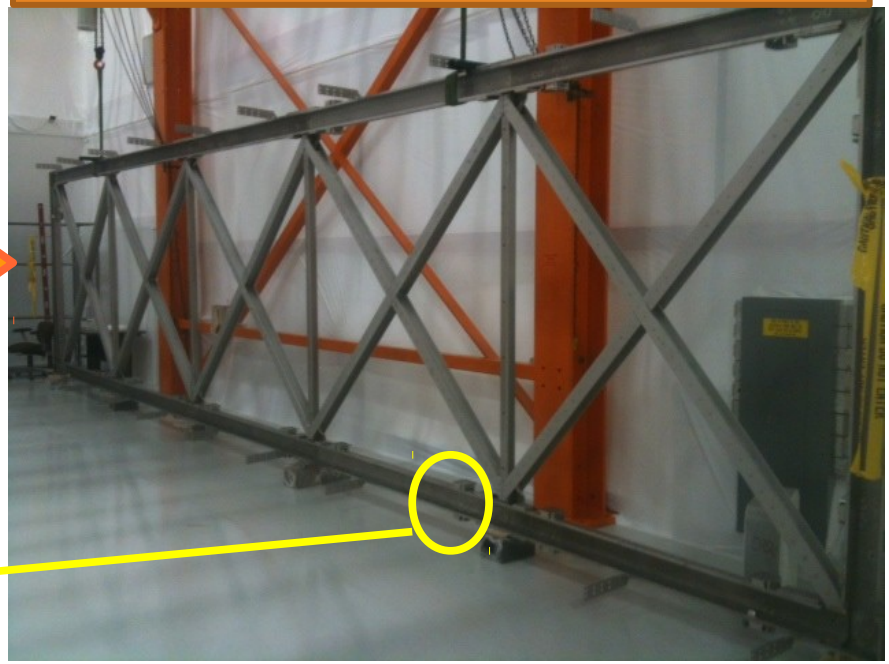
With help from John Voirin, Tim Griffin, and Mark Shoun

Assembly Activity at DØ
Assembly Building

Attaching the adjusting assemblies for the wire tensioning



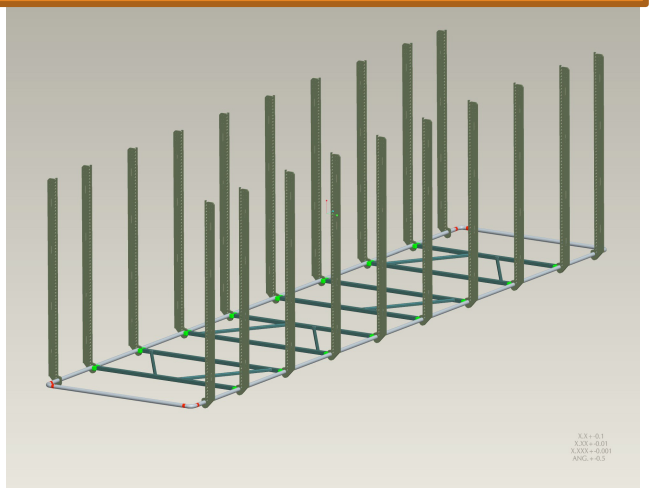
Completed Anode Frame

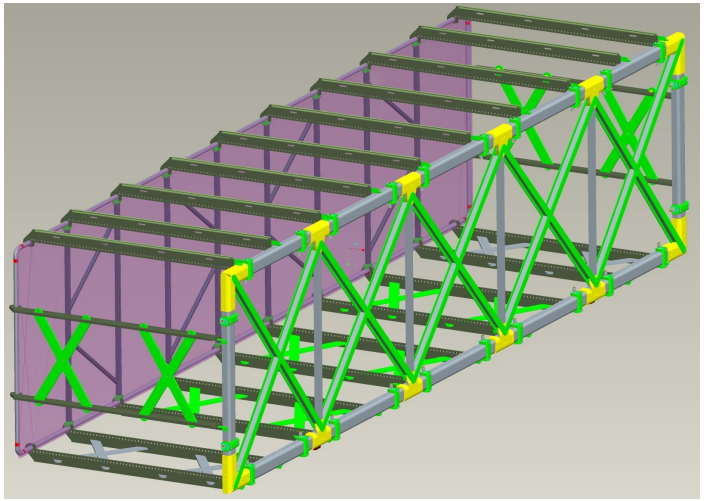


What is coming for TPC assembly in the next few weeks...

Cleaning and transporting the remaining field cage tubes

Begin assembly of the cathode frame with newly cleaned G-10 and field cage parts





Rotate and attach the cathode frame to the anode frame

MicroBooNE TPC Assembly and Construction

- **Assembly of the MicroBooNE TPC is progressing quickly**
  - Come visit the assembly tent at DØ
- **Many thanks to all the undergraduates, grad-students, post-docs, scientists, and and technicians who have contributed so far to the assembly**
  - Special thanks to Jen Raaf and John Voirin for their leadership
- **Lots more activities and updates from MicroBooNE in the coming weeks**